

KH-2017
PATENT

In re Application of Hans-Wilm Heinrich
Serial No. 10/727,247
Filed: December 3, 2003

RESPONSE TO FINAL OFFICE ACTION OF SEPTEMBER 29, 2005

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The following is the current set of claims that replaces all earlier versions of the claims:

Claims 1-20. Cancelled.

Claim 21. Cancelled

22. (Currently Amended) ~~The method of claim 21~~ A method of producing a sintered cemented carbide body comprising the steps of
providing a powder mixture comprising tungsten carbide powder, a binder metal powder comprising at least one metal of the iron group or an alloy thereof, and at least one or both of a solid solution carbide powder of zirconium and niobium or a solid solution carbonitride powder of zirconium and niobium;
forming a green compact of said powder mixture; and
vacuum sintering or sinter-HIP said green compact at a temperature of from 1400 to 1560 °C wherein the solid solution carbide powder of zirconium and niobium or the solid solution carbonitride powder of zirconium and niobium having a mass ratio Nb/(Zr + Nb) equal to or greater than about 0.5.

23. (Previously Presented) The method of claim 22 wherein the solid solution carbide powder of zirconium and niobium or the solid solution carbonitride powder of zirconium and niobium having a mass ratio Nb/(Zr + Nb) greater than or equal to about 0.6.

24. (Currently Amended) The method of claim 24 ~~22~~ wherein the binder metal powder comprises one or more of cobalt powder, nickel powder and iron powder.

25. (Original) The method of claim 24 wherein said binder metal powder additionally comprises at least one of chromium and tungsten.

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26. (Currently Amended) The method of claim ~~21~~ 22 wherein said binder metal powder comprises between about 3 weight percent and about 15 weight percent of the total mass of said powder mixture.

27. (Currently Amended) The method of claim ~~21~~ 22 wherein said powder mixture additionally comprises at least one carbide, nitride or carbonitride of one or more of titanium, hafnium, vanadium, tantalum, chromium, and molybdenum.

28. (Currently Amended) The method of claim ~~21~~ 22 wherein the total of the solid solution carbide powder of zirconium and niobium and the solid solution carbonitride powder of zirconium and niobium comprises between about 1 weight percent and about 15 weight percent of the total mass of said powder mixture.

29. (Currently Amended) The method of claim ~~21~~ 22 wherein said powder mixture comprises at least one of the elements titanium, hafnium, vanadium, tantalum, chromium and molybdenum in an amount between about 1 weight percent and about 8 weight percent of the total mass of said powder mixture.

Claims 30 through 35. Cancelled

36. (Currently Amended) ~~The method of claim 21~~ A method of producing a sintered cemented carbide body comprising the steps of
providing a powder mixture comprising tungsten carbide powder, a binder metal powder comprising at least one metal of the iron group or an alloy thereof, and at least one or both of a solid solution carbide powder of zirconium and niobium or a solid solution carbonitride powder of zirconium and niobium;
forming a green compact of said powder mixture; and
vacuum sintering or sinter-HIP said green compact at a temperature of from 1400 to 1560 °C wherein the total of the solid solution carbide powder of zirconium and niobium and the solid solution carbonitride powder of zirconium

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and niobium comprises between greater than 10 weight percent and about 15 weight percent of the total mass of said powder mixture.

Claim 37. **Cancelled.**

38. (Currently Amended) ~~The method of claim 37~~ A method of producing a sintered cemented carbide body comprising the steps of
providing a powder mixture comprising tungsten carbide powder, a binder metal powder comprising at least one metal of the iron group or an alloy thereof, and at least one or both of one or both of a solid solution carbide powder consisting essentially of zirconium and niobium or a solid solution carbonitride powder consisting essentially of zirconium and niobium;
forming a green compact of said powder mixture; and
vacuum sintering or sinter-HIP said green compact at a temperature of from 1400 to 1560 °C wherein the solid solution carbide powder of zirconium and niobium or the solid solution carbonitride powder of zirconium and niobium having a mass ratio Nb/(Zr + Nb) equal to or greater than about 0.5.

39. (Currently Amended) ~~The method of claim 37~~ A method of producing a sintered cemented carbide body comprising the steps of
providing a powder mixture comprising tungsten carbide powder, a binder metal powder comprising at least one metal of the iron group or an alloy thereof, and at least one or both of one or both of a solid solution carbide powder consisting essentially of zirconium and niobium or a solid solution carbonitride powder consisting essentially of zirconium and niobium;
forming a green compact of said powder mixture; and
vacuum sintering or sinter-HIP said green compact at a temperature of from 1400 to 1560 °C wherein the solid solution carbide powder of zirconium and niobium or the

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solid solution carbonitride powder of zirconium and niobium having a mass ratio Nb/(Zr + Nb) greater than or equal to about 0.6.

40. ~~(Currently Amended) The method of claim 37~~ A method of producing a sintered cemented carbide body comprising the steps of
providing a powder mixture comprising tungsten carbide powder, a binder metal powder comprising at least one metal of the iron group or an alloy thereof, and at least one or both of one or both of a solid solution carbide powder consisting essentially of zirconium and niobium or a solid solution carbonitride powder consisting essentially of zirconium and niobium;
forming a green compact of said powder mixture; and
vacuum sintering or sinter-HIP said green compact at a temperature of from 1400 to 1560 °C wherein the total of the solid solution carbide powder of zirconium and niobium and the solid solution carbonitride powder of zirconium and niobium comprises between greater than 10 weight percent and about 15 weight percent of the total mass of said powder mixture.

Claim 41. Cancelled.